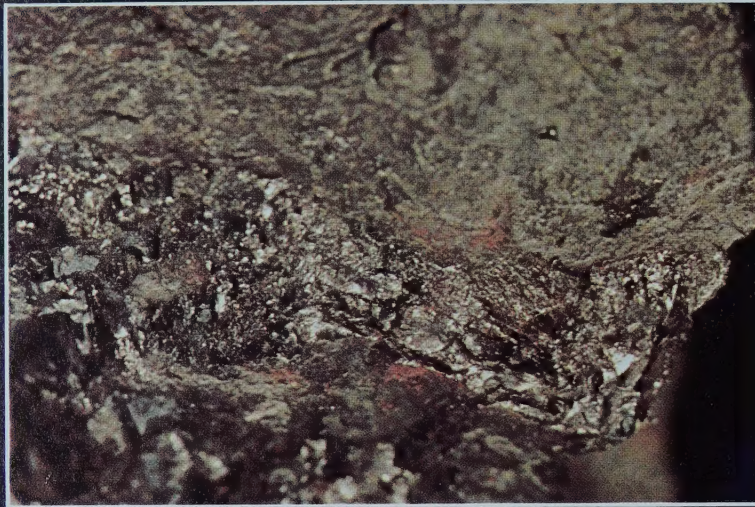


AR79

ANNUAL REPORT 1975

ELDORADO

ELDORADO NUCLEAR LIMITED



COVER PHOTO

High-grade ore from Eldorado Nuclear Limited's Beaverlodge Operations.

We are the people who supply nuclear fuel to the world.

ELDORADO

ELDORADO NUCLEAR LIMITED

ANNUAL REPORT 1975

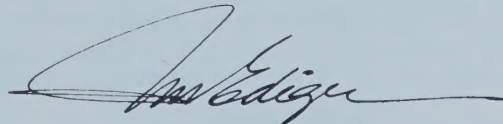
Ottawa, Ontario,
15 March 1976

The Honourable Alastair Gillespie,
Minister of Energy, Mines and Resources,
House of Commons,
Ottawa.

Sir,

On behalf of the Board of Directors, I hereby present the Annual Report of Eldorado Nuclear Limited for the fiscal year ended 31st December 1975, together with the financial statements of Eldorado Nuclear Limited and Eldorado Aviation Limited and the Auditor's Report.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read 'N. Ediger', with a long horizontal flourish extending to the right.

Nicholas M. Ediger,
President.

ELDORADO

ELDORADO NUCLEAR LIMITED

DIRECTORS

Hon. John B. Aird, Q.C.
Aird, Zimmerman & Berlis
Toronto

Clement G. Baschenis
Executive Vice-President
Eldorado Nuclear Limited
Ottawa

Marcel Bélanger
Bélanger, Dallaire, Gagnon & Assoc.
Quebec

W. J. Bennett
President
The Iron Ore Company of Canada Limited
Montreal

Dr. Roger A. Blais
Vice Dean – Research
Ecole Polytechnique
Montreal

Nicholas M. Ediger
President
Eldorado Nuclear Limited
Ottawa

Gerry Godsoe, Jr.
Stewart, MacKeen & Covert
Halifax

Maurice A.A.C. Swertz
Swertz Bros. Construction Ltd.
Weyburn, Saskatchewan

N. G. Van Nest
President
Triarch Corporation Limited
Toronto

OFFICERS

Nicholas M. Ediger
President

Clement G. Baschenis
Executive Vice-President

David J. Elgee
Secretary-Solicitor

Thomas J. Gorman
Vice-President, Finance

G. A. Frost
Treasurer

G. R. Burton
Assistant Secretary

DIVISIONAL MANAGERS

M. J. Moreau
Exploration

George Boyce
Marketing

R. G. Dakers
Research & Development

Gordon Colborne
Refinery Operations

W. E. Tranmer
Port Hope Refinery

D. D. Bell
Western Operations

Peter Clarke
Beaverlodge Operations

HEAD OFFICE

Suite 400, 255 Albert St.,
Ottawa, Ontario K1P 6A9

REFINERY OPERATIONS

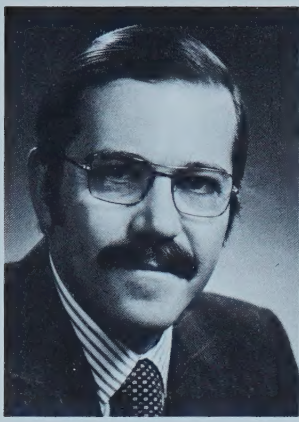
215 John St., Port Hope, Ontario
L1A 3A1

WESTERN OPERATIONS

10040-105th St.,
Edmonton, Alberta
T5J 1C3

BEAVERLODGE OPERATIONS

P.O. Box 7010,
Eldorado, Saskatchewan
S0J 0T0



PRESIDENT'S COMMENTS

In some quarters, the advocates of nuclear power are seen to be at odds with the proponents of "alternative" energy sources—solar energy, tidal and wind power, geothermal power, and the like. This is an unfortunate misconception. Everyone involved in the nuclear industry, including policy makers, is very concerned with the severity of the potential gap between supply and demand for energy, and welcomes every means of reducing the impact of that future imbalance.

However, it has become increasingly more apparent that renewable sources of energy require a great deal more development, and most authorities are now agreed that they may only begin to contribute significantly to our energy supply in thirty years' time. In the meantime, we face the prospect of virtual exhaustion of accessible hydro power and growing shortages of environmentally clean fossil fuels. Conservation measures will reduce the impact of the expected short-fall in energy supply, but at the moment nuclear power is the only viable source. The issue is not nuclear power or renewable energy; it is how to develop nuclear and renewable energy sources.

The nuclear industry is as safe as any other human activity; its operations are conducted in a manner which can withstand public scrutiny at all times. In keeping with this principle it is the policy of Eldorado Nuclear Limited that all activities must meet high standards of safety and environmental cleanliness, regardless of the economic consequences.

Although the nuclear industry is one of the most highly regulated activities in the world, greater emphasis must be placed on the development of criteria that will ensure uniform application of standards for all phases of the fuel cycle.

The difficulties are not ones of public safety and protection of the environment, for the industry has proven that it can produce electricity without even a fraction of the health and community risk presented by many other industrial operations, including coal-fired generating plants. The difficulty lies in communicating these achievements to the general public.

We recognize, too, that some critics will always remain unconvinced by scientific argument, by economic reasoning, or, indeed, by any rational analysis of alternative courses of action.

As an important member of the nuclear industry

Eldorado recognizes its growing role in helping to satisfy the demand for the fuel required in Canada's domestic nuclear program and growing export markets.

To achieve this objective, Eldorado has, in the past year, rebuilt and reorganized its management team, increased its exploration for new ore bodies, strengthened its research and development activity, and planned a large capital investment program, both to enlarge its mining and milling operations at Beaverlodge in northern Saskatchewan and to bring new refineries on stream by the early 1980's. At the same time, Eldorado is actively considering a larger role in other phases of the nuclear fuel cycle.

Manpower planning and resource taxation are important variables in any equation for the future. The acute shortage of skilled personnel to support mining in frontier areas has led Eldorado to initiate what we believe are innovative, long-term programs to recruit, train and retain employees from among the native people in these areas. However, the total taxes applied to resource industries are beyond the control of corporations; the uncertainty created by the restructuring of royalty regimes throughout Canada in recent years has discouraged uranium exploration and development at the very time when it should be intensified. We can only hope that governments will be realistic in their demands.

In 1975, Eldorado earned a profit of \$9.7 million, due mainly to the sale of mine concentrates from inventory, compared with a profit of \$2.6 million in 1974. Gross sales rose 42% to \$48.5 million. This follows five consecutive years of losses, aggregating in excess of \$15 million for the 1969-1973 period, reflecting the depressed state of a world uranium market whose recovery is now assured.

I cannot forgo this opportunity of expressing the Company's gratitude for the services of four Directors who retired during 1975: Dr. W. F. James, who was a member of the Board for 30 years; W. M. Gilchrist, former Chairman of the Board, who was a Director and the Company's Chief Executive Officer for 16 years; Gordon Lawson, who was a Board member for 15 years, and W. S. Kirkpatrick, who was a Director since 1968. Each made a valuable contribution to the Company.

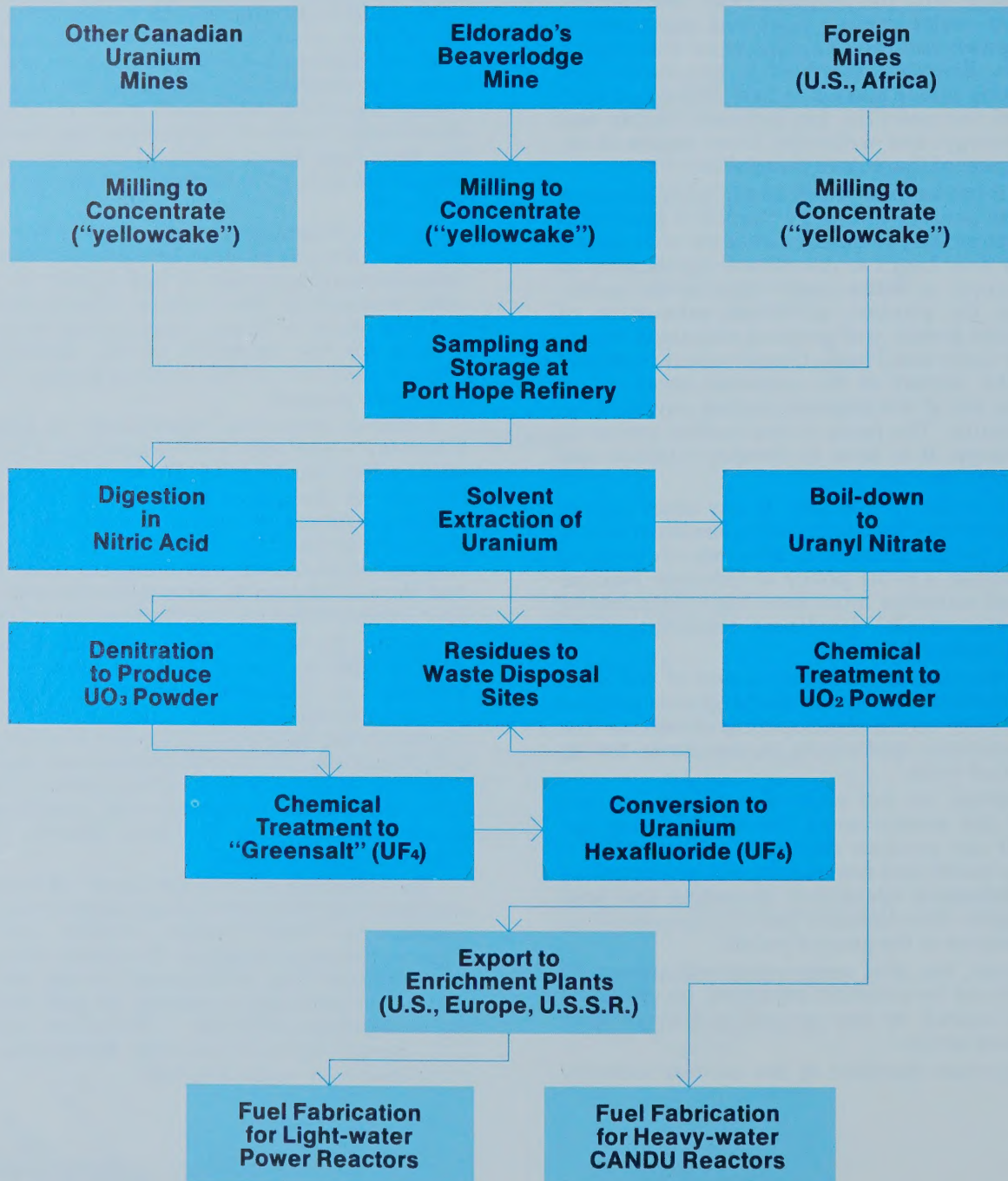
Joining the Board in 1975 were Honourable John B. Aird, of Toronto, partner of Aird, Zimmerman & Berlis, Barristers & Solicitors; Clement G. Baschenis, Vice President of the Company; Gerry Godsoe, Jr., of Halifax, partner in the legal firm of Stewart, MacKeen & Covert; and Maurice A.A.C. Swertz, of Weyburn, Saskatchewan, President of Swertz Bros. Construction Ltd. Early in 1976, the Board membership was completed with the appointment of N. G. Van Nest, Toronto, President of Triarch Corporation Ltd.

The Company's Executive Committee was strengthened early in 1976 with the appointments of Thomas J. Gorman, as Vice-President Finance, and David J. Elgee as Secretary-Solicitor. The senior management of the Company was reorganized during the year by a number of other appointments, in part resulting from the retirements of Robert C. Powell as Secretary, and J. C. Burger as Vice-President, Marketing, both after more than thirty years of service.

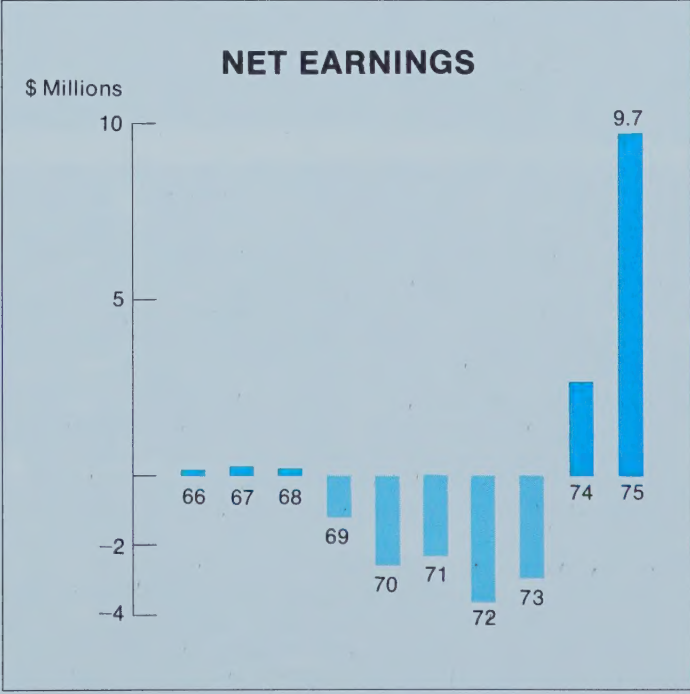
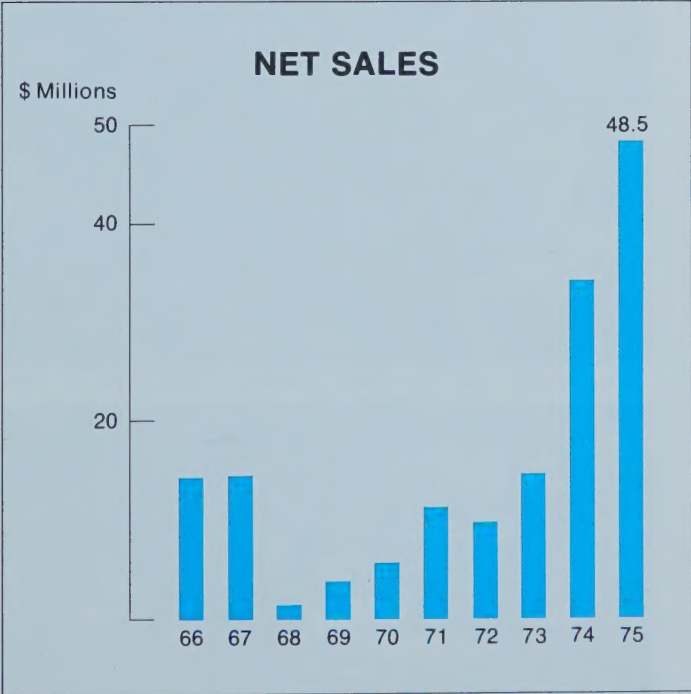
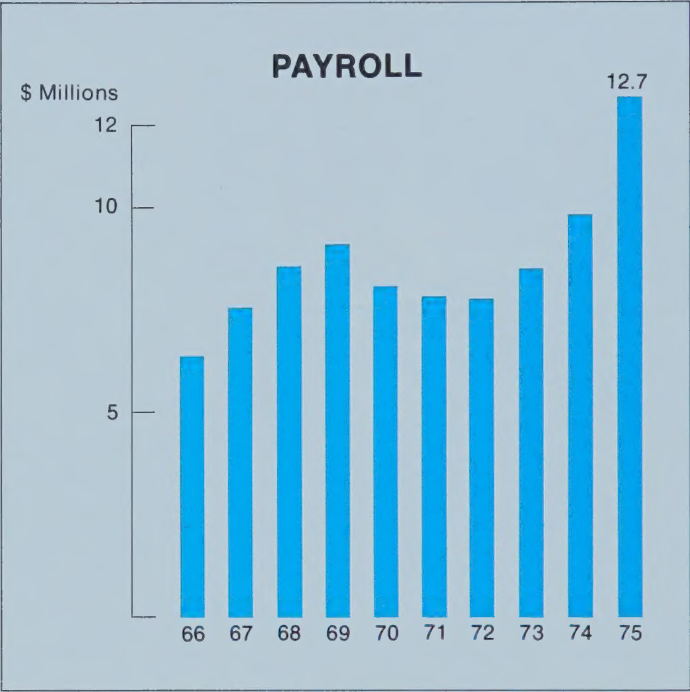
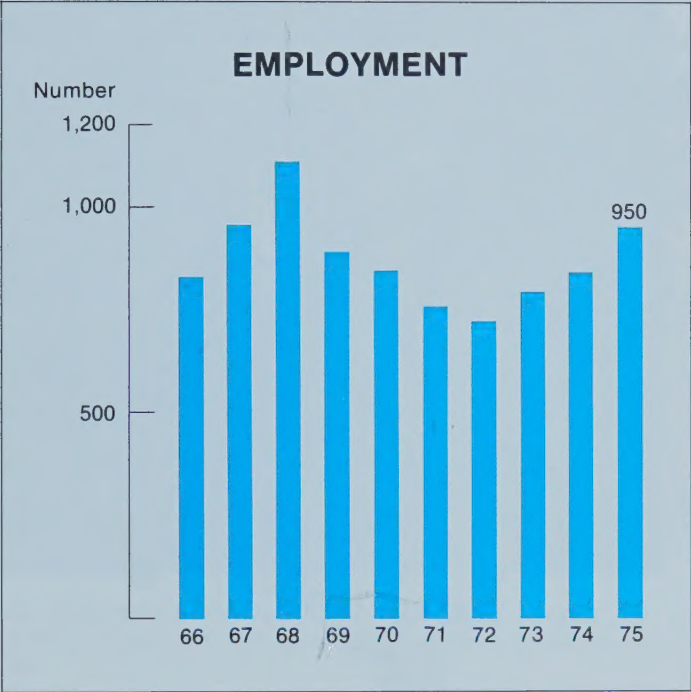
Nicholas M. Ediger,
President

The Nuclear Fuel Cycle

Eldorado Nuclear Limited's current participation in the nuclear fuel cycle is shown in the darker blue.



Vigorous recovery from the uranium-market depression of the 1969-73 period is clearly reflected in these charts.



Exploration

BEAVERLODGE, SASKATCHEWAN –

Exploration is accelerating both on claims held directly by Eldorado and on properties acquired under agreements with other mining companies. Activities in the Beaverlodge region also include evaluation of ore reserves in the area.

MOUNTAIN LAKES AREA, N.W.T. –

A diamond drilling program was completed in 1975. This was a joint venture with Siebens Oil and Gas Limited and Aquitaine Company of Canada Limited.

FOND-DU-LAC AREA, SASKATCHEWAN –

The edge of the favorable Athabaska sandstone formation is the target of two Eldorado joint-venture projects: one with FAMOK Ltd., the other with AMOK Ltd. and the Saskatchewan Mineral Development Corporation.

NORTHEASTERN ALBERTA –

Eldorado is conducting a reconnaissance program on Permits covering approximately 390 square miles.

NORTHWESTERN SASKATCHEWAN –

A joint venture with Power Reactor and Nuclear Fuel Development Corporation of Japan involves ground follow-up and assessment of more than 500 airborne radiometric anomalies.

JAMES BAY AREA, QUEBEC –

An extensive exploration program is being carried out by a joint venture comprising Eldorado Nuclear, SES (SERU Nucléaire (Canada) Ltée), and Société de Développement de la Baie James. During 1975 geological mapping, prospecting, geochemical sampling and airborne and ground geophysical surveys were conducted. Additional ground geophysical surveys and drilling are planned for 1976.

An aggressive search for new uranium orebodies has been mounted by Eldorado Nuclear Limited.

Exploration directly by Eldorado and in collaboration with others resulted in total expenditures of \$4.5 million in 1975, and this will increase to approximately \$8 million in 1976.

Major areas of field activity are shown on the map.

The company's Exploration Division has 20 geologists and geophysicists, based in Ottawa and Beaverlodge, Saskatchewan. From basic project planning a typical exploration program moves through this sequence:

- Field work includes geological prospecting, reconnaissance geochemical surveys, and airborne geophysical surveys.
- As a project develops, emphasis shifts to more detailed geological mapping, geochemical sampling, and geophysical surveys on the ground.
- Once a specific target is outlined, it is evaluated by more geochemical and geophysical surveys and by diamond-drilling.
- If the exploratory drilling reveals significant mineralization, development drilling is launched to determine whether mining would be feasible.

Eldorado uses the most advanced exploration technology, and is actively developing and implementing new techniques for uranium exploration.



Mining



Since Eldorado's Beaverlodge operations began in 1953 they have yielded almost 35 million pounds of U_3O_8 .

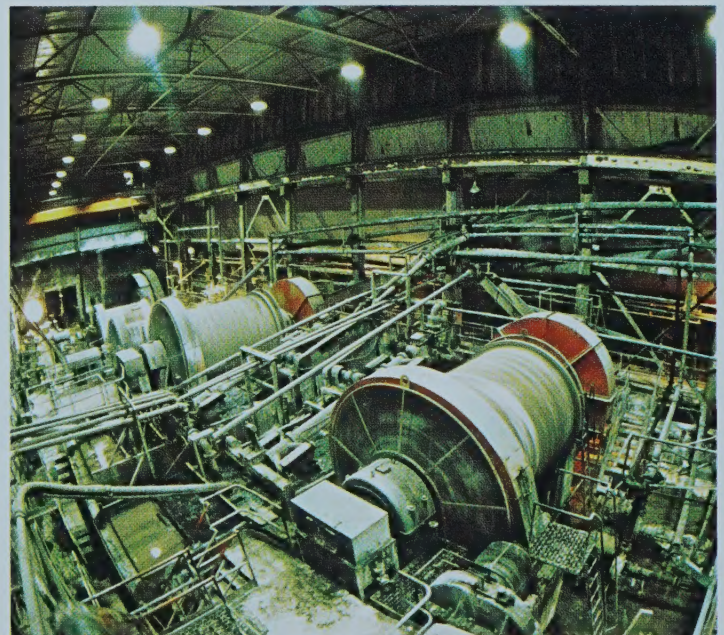
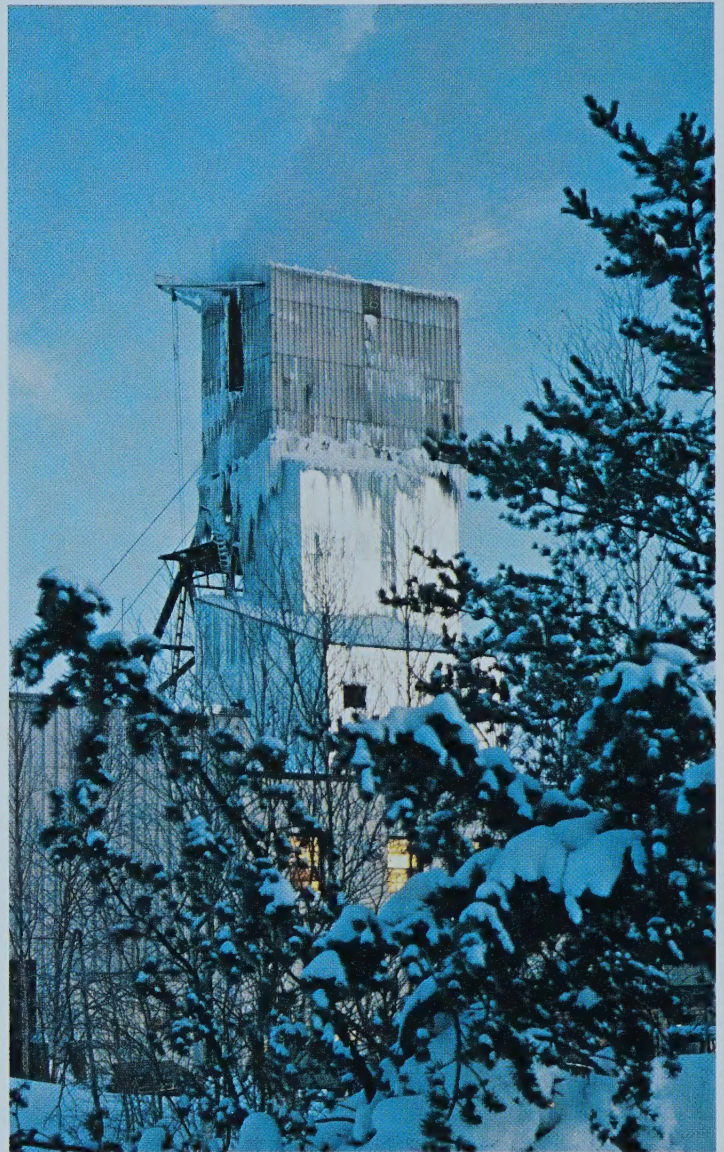
The main Beaverlodge mine—the Fay, including its “winze” or underground shaft—now is about one mile below the surface and accounts for approximately 90% of the ore feed to the mill. The balance comes from a low-grade openpit operation.

Mine-mill production in 1975 was at the highest level in four years. Almost 150,000 tons of ore were mined and yellowcake production reached 855,000 pounds of U_3O_8 , about 23% above 1974 levels.

Development in the Fay winze, plus the addition of reserves from potential open-pit operations and satellite underground orebodies, have increased the mine's proven reserves (grading 0.20% U_3O_8) to almost 3.3 million tons, a gain of over half a million tons since the end of 1974. With additions made to reserves year by year as mine development proceeds, total reserves at the start of 1976 were at approximately the same level as 20 years earlier despite the large volume of ore mined over that period.

Although substantial increases in mill output are planned it is anticipated that—given current economic prospects and no adverse change in the royalty regime—existing and indicated ore reserves will support this increasing mill production until at least the mid-1980's. Moreover, on the reasonable assumption that Eldorado will continue the historical pattern of adding to proven reserves each year, the life of the Beaverlodge operation would be considerably longer.

Some of these reserves are in the Verna mine, closed since 1969 but now being rehabilitated for full-scale mining by 1977.



Refining



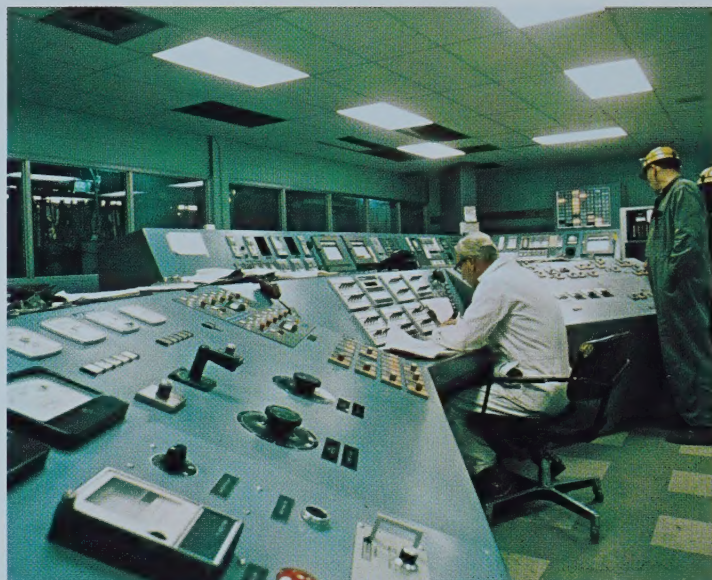
Eldorado's refinery in Port Hope, Ontario, is the only such refinery in Canada and acquires its feedstock in the form of mine concentrates ("yellowcake") from the company's own operation at Beaverlodge, from other uranium mines in Canada, and from the United States and overseas.

An early stage of the refining process produces the intermediate product uranium trioxide, UO_3 . Due to increased utilization of plant capacity and improved control of chemical circuits, output of uranium in the form of UO_3 almost doubled in 1975 to approximately 9.1 million pounds. In one month alone the refinery achieved a production record of 1 million pounds.

From UO_3 Eldorado Nuclear produces two main uranium products:

Natural ceramic-grade uranium oxide (UO_2)—Eldorado produces UO_2 as a powder, which is subsequently pelletized by fuel-fabricating companies as fuel for the Canadian system of CANDU heavy-water reactors. Eldorado has produced all of the UO_2 fuel used in CANDU reactors and the output in 1975 was close to 1.2 million pounds, approximately the same level as a year earlier.

Uranium hexafluoride (UF_6)—A separate chemical circuit at the Port Hope refinery converts UO_3 first to "greensalt" (uranium tetrafluoride, UF_4) and then to UF_6 , the form of uranium required as feed for enrichment plants around the world that increase the U_{235} content for light-water reactor fuel. Eldorado's output of uranium in the form of UF_6 rose to 5.4 million pounds in 1975, an increase of 20% from a year earlier.



ELDORADO

ELDORADO NUCLEAR LIMITED

Consolidated Financial Statement

Year ended December 31, 1975

Notes to Consolidated Financial Statements

1. Accounting Policies.

(a) *Basis of consolidation.* The method of presentation of the financial statements has been changed to include with the accounts of Eldorado Nuclear Limited those of its wholly-owned subsidiary, Eldorado Aviation Limited. The 1974 statements are restated to reflect this change.

(b) *Inventories.* In 1975 the Company changed its method of accounting for inventories of mine concentrates from first-in, first-out to weighted-average cost. The effect on reported earnings for the year 1975 was a decrease of \$4,061,158.

The cost of refined products is determined by the first-in, first-out method.

The inventories of both mine concentrates and refined products are valued at the lower of cost and net realizable value. Operating and general supplies are valued at cost.

(c) *Depreciation and amortization.* Refinery preproduction and mine development costs are being written off by unit-of-production methods, ensuring full amortization over not more than 10 years at capacity output.

Wherever appropriate, depreciation is taken on a unit-of-production basis at rates that would fully amortize the assets over 10 years at capacity output. Where a unit-of-production basis is not appropriate, plant and equipment are written off over 10 years on a straight-line basis.

2. Loans from Canada.

The terms of the Company's financing arrangements were amended by Order in Council P.C. 1973-1772 of June 26, 1973, which provides for repayments of principal to be deferred until 1978 or earlier at the company's option, but to be completed by 1983. Interest on the loans may also be deferred at the Company's option until December 31, 1984. These loans bear interest at rates up to 8³/₈%. The interest on the notes has been accrued to December 31, 1975.

3. Depreciation and Amortization.

Depreciation for the year totalled \$3,150,834, and the amortization of preproduction and mine development costs amounted to \$65,192.

4. Other Income and Expense.

	1975	1974
Expenses — Interest on loans from Canada . . .	\$ 3,519,266	\$ 3,574,373
Miscellaneous	536,977	130,269
Income — Interest and other non-operating items	(1,095,229)	(439,469)
Government of Canada grants for exploration	(2,388,311)	(1,190,711)
Net expense	<u>\$ 572,703</u>	<u>\$ 2,074,462</u>

5. Extraordinary Item.

The shares of Northern Transportation Company Limited, a Crown Corporation, which had been carried at cost as an investment on Eldorado's accounts, were transferred at no cost to the Minister of Transport, the Minister responsible to Parliament for that company.

6. Income Taxes.

No income taxes are payable for 1975 as losses carried forward from prior years exceed the estimated taxable income.

The loss carry forward for tax purposes is approximately \$10,600,000. This amount which has not been recognized in the financial statements is available to reduce taxable income in future years.

7. Supplementary Information.

The Company's by-laws provide for nine directors. However, due to the resignation of one director on September 30, 1975, the Company had eight directors and four officers at December 31, 1975. Two of the directors were also officers. Remuneration of officers and directors in 1975 totalled \$287,365.

ELDORADO

ELDORADO NUCLEAR LIMITED

Consolidated Statement of Earnings and Retained Earnings

For the year ended December 31, 1975

	<u>1975</u>	<u>1974</u>
Income		
Sales of products & services	\$ 48,499,229	\$ 34,130,485
Expenses		
Cost of products & services sold	31,747,646	23,060,427
Research & Development	1,341,254	590,788
Administration	1,274,723	556,476
Exploration	3,098,370	1,717,703
Marketing	590,744	542,887
Other income and expense (Note 4)	572,703	2,074,462
	<u>38,625,440</u>	<u>28,542,743</u>
Net earnings before extraordinary items	9,873,789	5,587,742
Transfer of investment to the Minister of Transport (Note 5)	159,147	—
Gain on sale of land	—	(498,563)
Pre-production costs written off	—	3,448,245
Net earnings after extraordinary items (Note 1 and 6)	<u>9,714,642</u>	<u>2,638,060</u>
Retained earnings at beginning of year	<u>35,780,786</u>	<u>33,142,726</u>
Retained earnings at end of year	<u>\$ 45,495,428</u>	<u>\$ 35,780,786</u>

The accompanying notes are an integral part of the financial statements.

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Assets

	<u>1975</u>	<u>1974</u>
Current Assets		
Cash	\$ 320,018	\$ 547,705
Short term bank deposits	27,300,000	5,800,000
Accounts receivable	5,211,968	15,612,496
Concentrates receivable from customers	16,108,659	10,055,088
Inventories of concentrates and refinery products (Note 1b)	28,314,270	40,933,728
Operating and general supplies (Note 1b)	5,537,961	4,106,015
Prepaid expenses	229,671	167,543
	<u>83,022,547</u>	<u>77,222,575</u>
Investments and Loans		
Investment in capital stock of wholly-owned subsidiary company, at cost (Notes 1a and 5)	—	159,147
Employees' housing loans	6,048	9,955
Municipal Corporation of Uranium City and District, 5% to 10¼% debentures, at par, maturing 1976-88.	357,304	421,784
	<u>363,352</u>	<u>590,886</u>
Unamortized pre-production and mine development costs (Notes 1c and 3)	<u>3,461,991</u>	<u>3,473,852</u>
Property and Equipment		
Land, plant and equipment, at cost.	89,560,450	83,513,994
Less: Accumulated depreciation (Notes 1c and 3)	58,897,210	55,937,081
	<u>30,663,240</u>	<u>27,576,913</u>
	<u>\$117,511,130</u>	<u>\$108,864,226</u>

The accompanying notes are an integral part of the financial statements.

Approved on behalf of the Board

Nicholas M. Ediger, Director
Clement G. Baschenis, Director

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LEAR LIMITED

(Canada Corporations Act)

Balance Sheet

31, 1975

Liabilities and Shareholders' Equity

	<u>1975</u>	<u>1974</u>
Current Liabilities		
Accounts payable	\$ 4,995,904	\$ 4,632,712
Interest due on loans from Canada (Note 2)	—	5,292,760
Advance payments against sales	1,015,483	713,281
	<u>6,011,387</u>	<u>10,638,753</u>
Long Term Liabilities		
Loans from Canada (Note 2)	53,044,675	53,044,675
Interest on loans — payment deferred (Note 2)	2,595,554	—
Advance payments against future sales	896,466	659,411
Other long term liabilities	2,881,540	2,154,521
	<u>59,418,235</u>	<u>55,858,607</u>
Shareholders' Equity		
Government of Canada		
Capital stock		
Authorized — 110,000 shares of no par value		
Issued — 70,500 shares, fully paid	6,586,080	6,586,080
Retained earnings	45,495,428	35,780,786
	<u>52,081,508</u>	<u>42,366,866</u>
	<u>\$117,511,130</u>	<u>\$108,864,226</u>

I have examined the above consolidated balance sheet and the related consolidated statements of earnings and retained earnings, and changes in financial position, and have reported thereon under date of March 1, 1976 to the Minister of Energy, Mines and Resources.

J. J. MACDONELL
Auditor General of Canada

ELDORADO

ELDORADO NUCLEAR LIMITED

Consolidated Statement of Changes in Financial Position

For the year ended December 31, 1975

	1975	1974
Sources of Working Capital		
Current Operations		
Net earnings before extraordinary items . . .	\$ 9,873,789	\$ 5,587,742
Add items not requiring an outlay of funds:		
Depreciation (Notes 1c and 3)	3,150,834	2,816,872
Amortization of pre-production and mine development costs (Notes 1c and 3)	65,192	689,426
Interest on loans (Note 2)	2,595,554	—
Estimated additional costs to replace borrowed UO ₃	204,218	—
Other	522,801	18,587
Total from current operations	16,412,388	9,112,627
Advance payments on future sales	302,067	—
Maturing Uranium City Debentures, etc.	100,387	100,267
Sale of land	—	501,563
Reduction in deferred accounts receivable	—	1,861,473
	<u>16,814,842</u>	<u>11,575,930</u>
Uses of Working Capital		
Property and equipment	6,237,162	5,174,466
Pre-production and mine development costs . .	53,330	112,756
Maturing of advance payments on future sales .	65,012	237,453
Uranium City Debentures—subscriptions . . .	32,000	—
Deferred loan interest to be paid in 1975	—	1,718,387
	<u>6,387,504</u>	<u>7,243,062</u>
Increase in working capital	10,427,338	4,332,868
Working capital at beginning of year	66,583,822	62,250,954
Working capital at end of year	<u>\$77,011,160</u>	<u>\$66,583,822</u>

The Honourable
Alastair W. Gillespie, P.C., M.P.,
Minister of Energy, Mines
and Resources,
House of Commons,
Ottawa, Ontario.

Dear Mr. Gillespie:

I have examined the consolidated balance sheet of Eldorado Nuclear Limited and its subsidiary as at December 31, 1975 and the consolidated statements of earnings and retained earnings, and changes in financial position for the year then ended. My examination included a general review of the accounting procedures and such tests of accounting records and other supporting evidence as I considered necessary in the circumstances.

As explained in Note 1(a) to the financial statements the Company changed its method of accounting for the investment in its wholly-owned subsidiary company from the cost basis used in previous years to consolidation of the accounts of the subsidiary company in the financial statements. The opening balances of retained earnings at January 1, 1975 and 1974 have been increased by \$257,039 to reflect the inclusion of the retained earnings of the subsidiary company.

As explained in Note 1(b) to the financial statements the Company changed its method of computing the cost of inventories of mine concentrates from a first-in, first-out basis to a weighted average basis.

In my opinion these consolidated financial statements give a true and fair view of the financial position of the companies as at December 31, 1975 and the results of their operations and the changes in financial position for the year then ended, in accordance with generally accepted accounting principles which, except for the changes, with which I concur, referred to in the preceding two paragraphs, have been applied on a basis consistent with that of the preceding year.

I further report that, in my opinion, proper books of account have been kept by the Company and its subsidiary, the financial statements are in agreement therewith and the transactions that have come under my notice have been within their statutory powers.

Yours sincerely,

J.J. MACDONELL
Auditor General of Canada

The accompanying notes are an integral part of the financial statements.



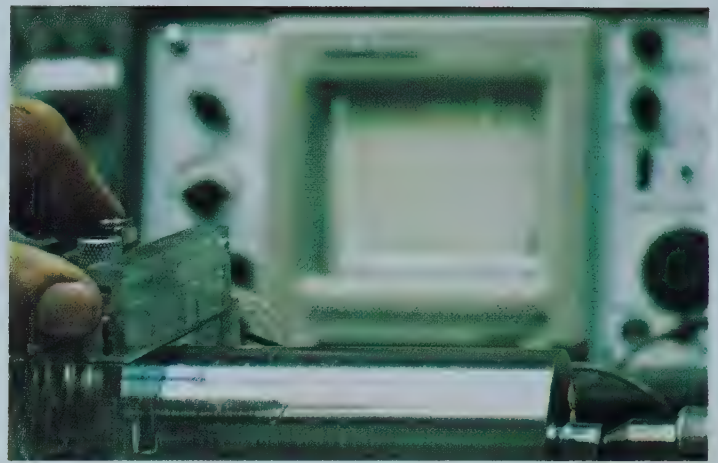
Continuous air support for the company's Beaverlodge operations is provided by Eldorado Aviation Limited, a wholly-owned subsidiary, based in Edmonton.

In addition, Eldorado Aviation continues to provide air support for Northern Transportation Company Limited operations along the Mackenzie River system and the Arctic coast.

During the year, Eldorado Aviation carried approximately 13,000 passengers and 8.1 million pounds of freight.

Flying mainly DC4s and DC3s, Eldorado Aviation Limited logged 4,053 hours in 1975, 20% more than a year earlier.

Metallurgical Development



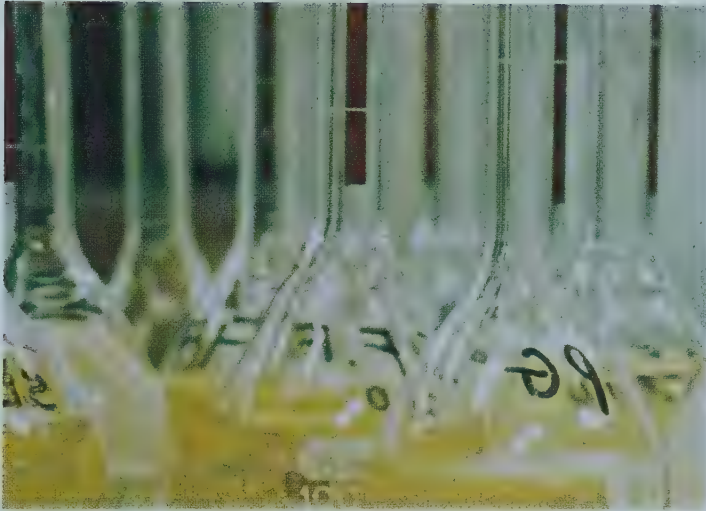
Eldorado Nuclear Limited's facilities in Port Hope, Ontario include metallurgical operations and developmental work with both enriched uranium and depleted uranium metal, which because of its high density and other unique qualities has a number of significant industrial applications:

The Company's metallurgical plant alloys various other metals with enriched uranium—that is, uranium with a U_{235} component that is higher than the uranium dioxide used in the CANDU reactors—to produce fuel for Canada's nuclear-power research program. Uranium-carbide fuel is produced for the Atomic Energy of Canada Limited reactor at Whiteshell, Manitoba, and uranium-aluminium billets for the NRX and NRU experimental reactors. Eldorado also manufactures uranium-zirconium booster fuel for the Bruce power reactors operated by Ontario Hydro.

Other metallurgical operations at Port Hope are concerned with a variety of present and potential uses of depleted uranium metal. Because of its properties, this metal can be used to shield radioactive substances. It now is used as shielding in radiographic cameras, and a large potential use—and a subject of continuing developmental effort—is its use in transport casks for spent fuel from power reactors. Still other uses are being investigated.



Research and Development



Eldorado Nuclear Limited has substantially increased its research and developmental program.

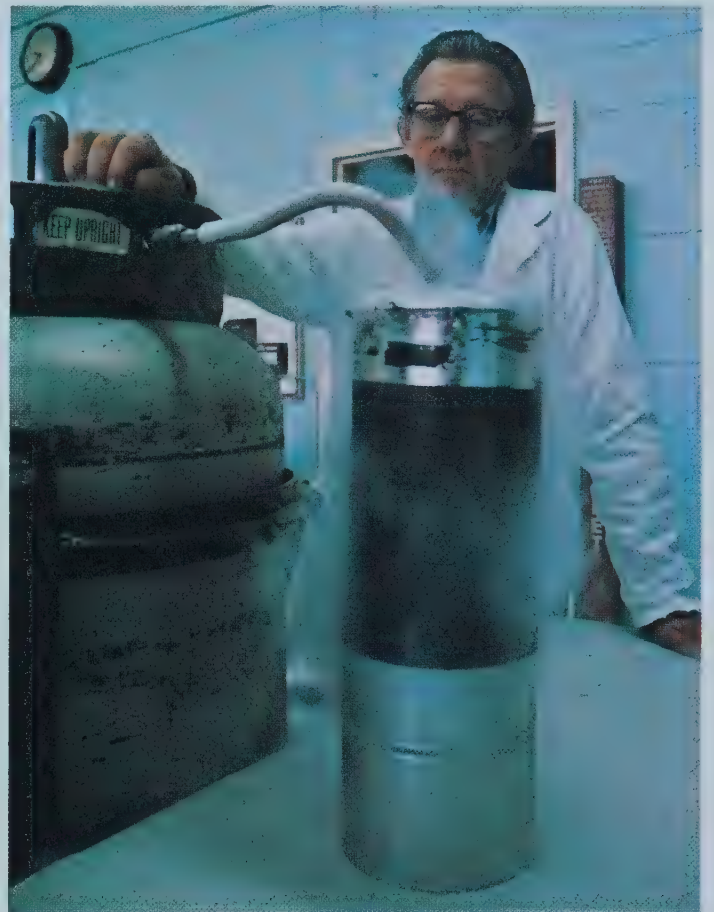
The objectives:

- More efficient uranium processing
- Elimination or improved treatment of wastes
- New metallurgical processes

One example of R&D success in 1975 was the development and installation of an ammonium uranate process for producing the natural UO_2 used as CANDU fuel. This process simultaneously produces a higher-quality product and eliminates the problem of treating and disposing of a liquid effluent containing dissolved nitrate salts. The process has been patented in Canada and applications for patents have been filed in six other countries.

Also developed was a new method of treating refinery residues by transforming them to stable solids, thus largely eliminating the possibility of environmental contamination by soluble radionuclides and nitrate salts.

Eldorado's annual R&D expenditures doubled to \$1.3 million in 1975, and will continue to be increased over the next decade.



Waste management



The chemical complexity of the uranium refining process is such that it cannot avoid creating waste products, and the management of these is a continuing Eldorado concern that reflects both environmental and health considerations.

For example, any such refinery needs cooling water, and Eldorado draws its supply from Lake Ontario at the Port Hope waterfront. Returned to the lake, this cooling water could be a potential pollutant. However, in Eldorado's case the outflow is of higher quality than the intake, and indeed meets – and exceeds – provincial standards for drinking water.

In the refining process itself, both the UO_2 and UF_6 chemical circuits produce solid residues which, although very low in radioactivity, nevertheless require careful handling and disposal. Both wastes are transported to a designated, approved, and constantly monitored residue-disposal site near Port Granby, 10 miles west of Port Hope, where they are buried. The site is licensed by the Atomic Energy Control Board, and both the radiation levels and the natural run-off to Lake Ontario are monitored regularly by the company as well as federal and provincial regulatory and environmental agencies.

Similarly, the refinery uses hydrofluoric acid in the UF_6 circuit – where it is separated by electrolysis into hydrogen and fluorine. Elaborate precautions are taken to avoid either an acid spill or an excess fluorine emission, and the company and the Ontario Ministry of the Environment maintain an intensive program of monitoring for airborne fluorides in areas near the refinery.

Other waste-management difficulties are posed by Eldorado operations of many years past. The most notable of these is a deposit of tailings, high in arsenic content, in a residue site near the community of Welcome which was used by Eldorado about 25 years ago. To prevent contamination of district groundwater and a neighbouring creek, the company for the past 20 years has trapped the run-off and disposed of it in Lake Ontario with regular monitoring by the Company and appropriate provincial authorities.





The nuclear industry must rank as one of the most highly regulated industries, and a large part of the regulations concerns the health of employees and of the people who live in the neighborhood of nuclear operations.

A prime concern is radiation exposure. Since the 1940s there has been a five-fold increase in the stringency of maximum annual acceptable radiation doses set for atomic workers by the International Commission on Radiological Protection (ICRP), an independent board of scientists whose recommendations are incorporated in the radiation regulations of most countries, including Canada. The current ICRP Standards are shown opposite.

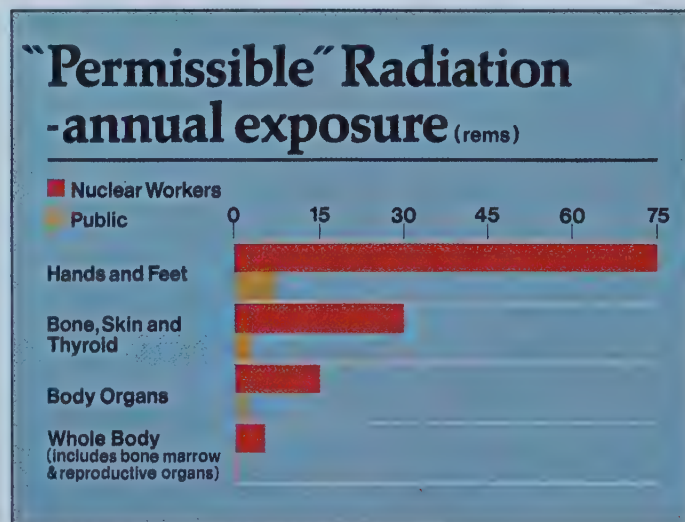
For the general public, permissible radiation exposure is set at one-tenth the level established for those who work in the nuclear industry. It is important to underline, however, that this permissible public dose level—one half of 1 Rem of whole-body radiation exposure per year—is exclusive of both natural background radiation and of medical and dental radiation exposure. The latter, arising mainly from X-rays, is considered to account for more than 90% of the general public exposure to man-made ionizing radiation. For example, it is an accepted fact that in one session a patient can receive 15 Rems of gamma radiation from a full set of gastro-intestinal-tract X-rays. That is triple the ICRP annual limit for exposure of radiation workers, and 30 times the annual permissible exposure (non-medical) for the public. This point has been generally overlooked by most participants in the public debate over radiation caused by the nuclear industry.

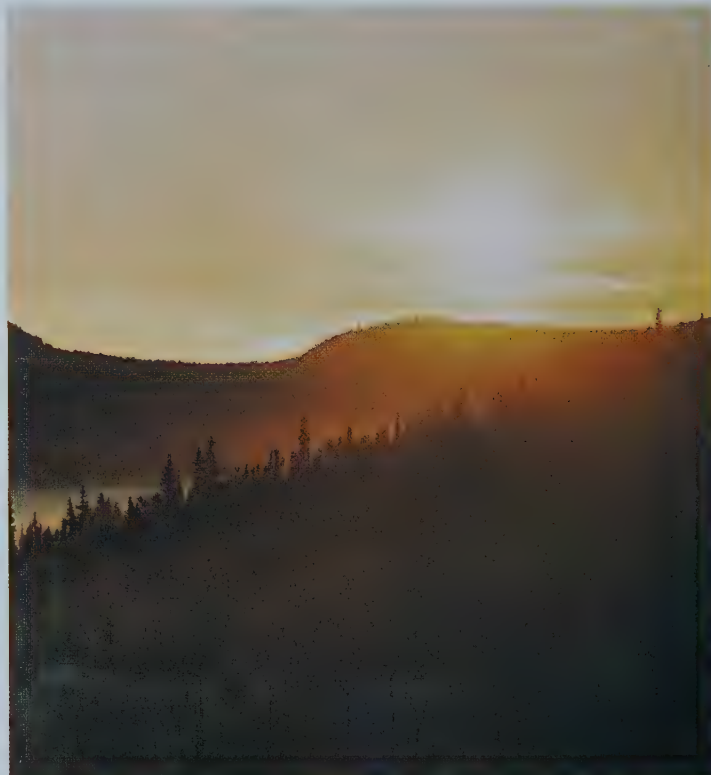
Eldorado constantly monitors the exposure of its own employees, by a system of dosimetry maintained in co-operation with the Radiation Protection Bureau of Health and Welfare Canada. Results from this program for 1975 show that the average individual whole-body exposure for Eldorado employees in the Port Hope refinery was about half of 1 Rem, while the highest individual exposure was 3.6 Rems—almost 40% below the ICRP limit.

Radon concentrations are also a major concern of the company, particularly in the Beaverlodge mine. Radon gas is a byproduct from the natural decay of radium, and radon itself slowly disintegrates in nature to radioisotopes of bismuth, polonium and lead (the so-called radon "daughters"). In high concentrations they are believed to be hazardous and a possible cause of lung cancer. As radioactive rock is broken in underground mining, the release of radon and its daughters poses a major problem.

At the Beaverlodge mine the solution to this problem is accomplished in two ways: first, through a powerful mine ventilation system designed for rapid air changes even in working places one mile below the surface, and second, by strict control of underground working time in relation to the presence of radon and the radon daughter-products. At no time in recent years have the measured "working levels" exceeded acceptable limits.

From evidence gathered in uranium mining around the world, there appears to be a synergistic connection between cigarette smoking and radon inhalation in the development of lung cancer. The company has conducted several anti-smoking campaigns in the Beaverlodge community, and intends to intensify this information program in the future.





Current waste-management practices at the Eldorado refinery in Port Hope, Ontario, are designed to minimize all dangers to the health of employees and members of the public. The operations come under continuous scrutiny from the Atomic Energy Control Board and other agencies of the Federal and Provincial Governments having responsibility in these matters. Similarly, the mine-mill operations at Beaverlodge in northwestern Saskatchewan are carried out with proper concern for the health and safety of the employees and the environment in which the Company operates.

In the 1930s and 1940s the Company processed unusually rich ores, chiefly from its Port Radium mine on Great Bear Lake. At that time, the Company's main product was radium for the treatment of cancer and for luminous dials. When the Company later shifted to the production of uranium from mine concentrates, the abandonment of the old radium circuit and the development of new refinery operations led to demolition of several buildings on the refinery site and to some excavations for new foundations. It now appears that some of these materials, some of which were contaminated, ended up being used for various purposes, including land fill, in the town of Port Hope.

During 1975 the Company initiated a program to identify potentially contaminated homes and public places. By early 1976 the extent of this problem had been substantially defined in a collaborative effort on the part of Eldorado Nuclear, the Atomic Energy Control Board, and the Ontario Ministry of Health.

On February 19, 1976, the Minister of Energy, Mines and Resources announced the establishment of a federal-provincial task force to expedite the clean-up of radioactive contaminants in Port Hope, and to assist the Atomic Energy Control Board in assessing the significance of radioactivity in other locations in Canada.



It now is beyond doubt that a large and growing part of worldwide energy requirements will have to be met by using nuclear reactors to generate the steam that will drive the turbines that will turn the electrical generators.

It is equally certain that we can expect rapid advances in the development of other sources of energy—solar, wind, geothermal. But even the most optimistic predictions for the success of these developments do not presume that their contribution to total energy demand would offset the growing shortage of fossil fuels. The obvious conclusion is that there is no real alternative to an exponential increase in the use of safe and environmentally clean nuclear power around the world.

This situation offers a major challenge to the Canadian nuclear industry in general, and to Eldorado Nuclear Limited in particular. A large part of the company's management effort now is directed towards the realization of this growth potential.

Eldorado's short-term capital investment and manpower planning includes not only its intensified exploration program, but also a doubling of its Beaverlodge investment and the establishment of two new refineries by the early 1980's.

The investment program at Beaverlodge totals almost \$50 million in the 1976-80 period. About 30% of this would be spent in social capital—housing and other forms of community infrastructure—and the balance in mine-mill development.

In its quest for additional refining capacity—which must be provided by the early 1980's to process the rising output of Canadian mines—Eldorado Nuclear Limited in early 1976 was concentrating its search for suitable sites in Ontario and Saskatchewan. This planned expansion would involve capital expenditures of more than \$100 million by 1980, and would greatly

supplement the Company's existing refining and metallurgical capacity at Port Hope, where enlargement of the present refinery is impossible due to physical and environmental limitations.

In its efforts to implement these plans Eldorado Nuclear Limited has two major difficulties:

First, the entire industry is suffering an acute shortage of skilled manpower, particularly for mining operations in relatively isolated northern communities. In addition to an active recruitment program for skilled miners and tradesmen, Eldorado has begun a program to develop the necessary skills among the native peoples of northern Saskatchewan.

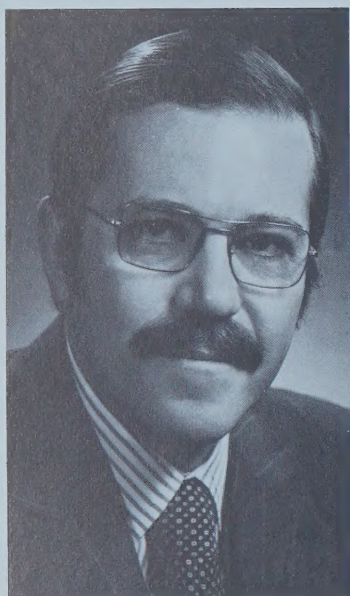
Second, the company's investment at the Beaverlodge facility is dependent on a satisfactory anticipated rate of return, given the grade of uranium ore being mined there. During 1975 the Government of Saskatchewan announced it was considering a new system of royalties that would significantly reduce the Company's returns not only from the existing mine, but from any new orebody defined in the current exploration program in that province. However, in announcing their new royalty structure the government stated that they wished to increase their share of the revenue without discouraging exploration and development. We trust that they will recognize the risks involved in mineral development and the necessity for a commensurate rate of return.

In its longer-term planning, Eldorado Nuclear envisages an accelerating demand for uranium that makes it imperative to develop, between 1985 and 2000, not only additional mines and refining capacity but also the capability to strengthen the Company's role in other phases of the nuclear fuel cycle.

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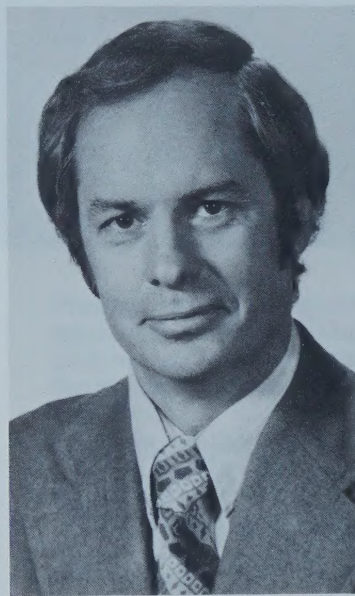
The Executive Committee



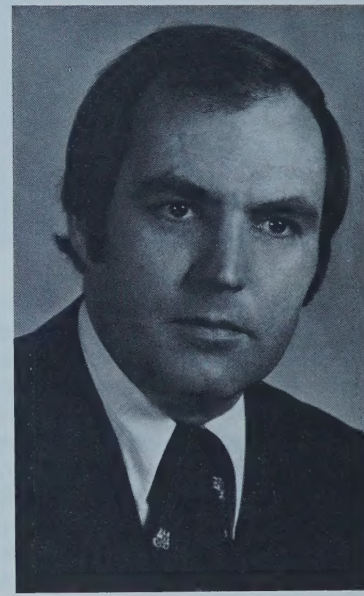
Nicholas M. Ediger
President and Chief Executive Officer



Clement G. Baschenis
Executive Vice President



Thomas Gorman
Vice President, Finance



David Elgee
Secretary-Solicitor



